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EXAMINER	
SINGH, HIRDEPAL	

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

	Application No.	Applicant(s)	
	10/815,335	CITTA ET AL.	
	Examiner	**Art Unit**	
	HIRDEPAL SINGH	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *60-62 and 64-84* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *60-62, 64-84* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed on July 16, 2008. Claims 60-62, 64-84 are pending and have been considered below.

Response to Arguments

2. The amendment corrected the 35 USC 112 issues in the previous claims. Therefore, the rejection under 35 USC 112 second paragraph is withdrawn.

3. Applicant's arguments with respect to claims 60-62, 64-84 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 60-62, 64-65 and 70-72 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 60 recites "…generating a reliability factor based upon a difference between at least two of the received signal values, wherein the reliability factor is a measure of reliability of the decoding."

6. However, the specification describes "… The output of Kerdock encoder 32 is subtracted from the input to the Kerdock decoder 26 by a summer 34 to form an error vector e representing the difference between the transmitted Kerdock code vector as received and a Kerdock" (page 13) and "..The reliability weighting level r is used by the multiplier 36 to scale the feedback represented by the error vector e and is a quantized value depending upon 4, which is the difference between the absolute value of the Walsh Transform output peak having the largest magnitude and the absolute value of the Walsh Transform output peak having the next largest magnitude." (page 14); also on Page 16 of the specification described is the reliability factor as "…the reliability weighting level r is a quantized value depending upon the difference between the absolute value of the Walsh Transform output spectral peak having the largest magnitude and the absolute value of the Walsh Transform output spectral peak having the next largest magnitude." It is not described that the reliability factor is based on difference between two of received signal values, but is the difference between the absolute value of the Walsh Transform output peak having the largest magnitude and next largest magnitude that is the decoded values not the received values. Therefore, the specification doesn't support the claimed feature(s).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

> invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 60-61, 64-66, 68-71, 73, 75, 77-79, 81 and 83-84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gosse et al. (US 6,690,723) in view of Webster et al. (US 2001/0036223) and further in view of Iwamatsu et al. (US 6,690,714).

Regarding claims 60 and 79:

Gosse discloses a method and system for decoding a received signal:

receiving a signal containing a code vector (column 2, lines 8-26, reduced state sequence estimation with vector indexes of received signal symbols is described and further improvement of using the same with reliable feedback decisions is described);

decoding the code vector (column 3, lines 1-12), wherein the decoding includes deriving a set (column 3, line 65- column 4, line 6; in the receiver the received signal is partitioned in sets or subsets and the size of set and number are described) of received signal values corresponding to the code vector.

Gosse discloses all of the subject matter as described above and further discloses a reliability factor is a measure of reliability of the decoding (70 and 72 in figure 5, the stopping rules; column 7, lines 20-25 control convergence and selective re-equalization based on the decision is checking the reliability) and to further make clear, generating a reliability factor based upon a difference between at least two of the received signal values a new reference is brought in.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where a reliability factor (as described in

the present invention reliability factor from the Walsh transform is used to weight the equalizer taps based on the decision according to value of reliability factor, that is similar to a decision in paragraph 0018 of Webster, made based on the correlated output (i.e. a Walsh transform paragraph 0021) and that decision is used to control receiver DFE for interference cancellation; figures 7 and 10) based upon a difference between at least two of the received signal values (paragraph 0062, the values to update taps are stored in a look up table, and the values are corresponding to sets of received code words, paragraph 0019).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Webster to generate a reliability factor (as shown by Iwamatsu, abstract; 21 in figure 6 and figure 7; the correlation value of Walsh transform is used as a reliability factor) based on received signal values in the Gosse as in the Walsh structure of Webster to make a decision for the reliability of the received signal in the system to make an improved equalizer system in the detector to advantageously have better reception with less complexity with optimized signal to noise ratio and lower propagation errors in the decision feedback equalizer.

Regarding claim 61:

Gosse discloses all of the subject matter as described above and further disclosing controlling an equalizer in accordance with the reliability factor (column 7, lines 20-25, the controlling the convergence and selectively implementing the re-equalization).

Regarding claim 64:

Gosse discloses all of the subject matter as described above except for specifically teaching the two received signal values are largest and next to largest of received signal values.

Iwamatsu in the same field of endeavor discloses a system and method for M sequence modulation in communication where the two received signal values are largest and next to largest of received signal values (column 22, line 55 - column 23, line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Iwamatsu to generate a reliability factor in the Gosse system based on difference between largest and next to largest of received signal values to make an improved equalizer system to get back the information about reliability, by using a code vector at the receiver to use the same decoding technique as use at the transmitter to encode the signal.

Regarding claim 65:

Gosse discloses all of the subject matter as described above and further discloses controlling equalizer (column 7, lines 20-25, the controlling the convergence and selectively implementing the re-equalization) in accordance with reliability factor.

Regarding claim 66:

Gosse discloses a method comprising:

receiving a signal containing a code vector (column 2, lines 8-26, reduced state sequence estimation with vector indexes of received signal symbols is described and further improvement of using the same with reliable feedback decisions is described);

decoding the code vector (column 3, lines 1-12), wherein the decoding includes deriving a set (column 3, line 65- column 4, line 6; in the receiver the received signal is partitioned in sets or subsets and the size of set and number are described) of received signal values corresponding to the code vector.

Gosse discloses all of the subject matter as described above and further discloses a reliability factor is a measure of reliability of the decoding (70 and 72 in figure 5, the stopping rules; column 7, lines 20-25 control convergence and selective re-equalization based on the decision is checking the reliability), except for specifically teaching that generating reliability based on at least one of received signal values comprising generating reliability based on a comparison of the one received signal value to a threshold.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where a reliability factor (as described in the present invention reliability factor from the Walsh transform is used to weight the equalizer taps based on the decision according to value of reliability factor, that is similar to a decision in paragraph 0018 of Webster, made based on the correlated output (i.e. a Walsh transform paragraph 0021) and that decision is used to control receiver DFE for interference cancellation; figures 7 and 10) based upon received signal values (paragraph 0062, the values to update taps are stored in a look up table, and the values are corresponding to sets of received code words, paragraph 0019) a reliability based on a comparison of the one received signal value to a threshold (claim 6 points

out the Walsh transform is generated by comparing received signal to a predetermined code, that is used for decision for reliability; paragraph 0066).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Webster to generate a reliability factor (as shown by Iwamatsu, abstract; 21 in figure 6 and figure 7; the correlation value of Walsh transform is used as a reliability factor) based on received signal values in the Gosse as in the Walsh structure of Webster to make a decision for the reliability of the received signal in the system to make an improved equalizer system in the detector to advantageously have better reception with less complexity with optimized signal to noise ratio and lower propagation errors in the decision feedback equalizer.

Regarding claim 68:

Gosse discloses all of the subject matter as described above except for specifically teaching that generating reliability factor based on a comparison of the one received signal value to a threshold comprising generating reliability factor only if the one received signal value is greater than the threshold.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where a reliability factor (paragraph 0018, and that decision is used to control receiver DFE for interference cancellation; figures 7 and 10) based upon received signal values (paragraph 0062, the values to update taps are stored in a look up table, and the values are corresponding to sets of received code words, paragraph 0019) a reliability based on a comparison of the one received signal value to a threshold (claim 6 points out the Walsh transform is generated by comparing

received signal to a predetermined code, that is used for decision for reliability; paragraph 0066).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Webster to generate a reliability factor based on comparison of received signal values with a threshold in the Gosse as taught in the Walsh structure of Webster to make a decision only if the received signal value is greater than threshold for the reliability of the received signal in the system to make an improved equalizer system in the detector to advantageously have better reception with less complexity with optimized signal to noise ratio and lower propagation errors in the decision feedback equalizer.

Regarding claim 69:

Gosse discloses all of the subject matter as described above except for specifically teaching the generated reliability signal/factor is dependent on the magnitude of one received signal value.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where the generated reliability signal/factor is dependent on the magnitude of one received signal value (paragraph 0056).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to generate a reliable signal/factor if the compared received signal value is greater than the threshold to generate the reliable signal/factor if the received signal value is greater than threshold to make sure the noise or interference level is under a limit to make an improved equalizer system for better reception.

Regarding claim 70:

Gosse discloses all of the subject matter as described above except for specifically teaching that the received signal values are provided to correlation estimator for estimating interference.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where the generated reliability signal/factor is dependent on the magnitude of one received signal value (paragraph 0020 and 0043).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to generate a reliable signal/factor if the compared received signal value is greater than the threshold to generate the reliable signal/factor if the received signal value is greater than threshold to make sure the noise or interference level is under a limit to make an improved equalizer system for better reception.

Regarding claims 71 and 84:

Gosse discloses all of the subject matter as described above except for specifically teaching that the reliable or error signal/factor is generated based on the difference between square of received signal value.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where the reliability is generated based on the difference between square of received signal values (paragraph 0056).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to generate a reliable signal/factor if the compared received signal

value is greater than the threshold to generate the reliable signal/factor if the received signal value is greater than threshold to make sure the noise or interference level is under a limit to make an improved equalizer system for better reception.

Regarding claim 73:

Gosse discloses a method and system for decoding a received signal:

receiving a signal containing a code vector (column 2, lines 8-26, reduced state sequence estimation with vector indexes of received signal symbols is described and further improvement of using the same with reliable feedback decisions is described);

decoding the code vector (column 3, lines 1-12), Gosse discloses all of the subject matter as described above and further discloses a reliability factor is a measure of reliability of the decoding (70 and 72 in figure 5, the stopping rules; column 7, lines 20-25 control convergence and selective re-equalization based on the decision is checking the reliability) except for specifically teaching wherein the decoding includes correlating the received code vector with a plurality of reference *code* vectors so as to produce a plurality of values corresponding to each of the reference code vectors, and wherein the values correspond to an amount of correlation between the received code vector and the reference code vectors.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where a reliability factor (a decision to reliably detect signal in paragraph 0018 of Webster, made based on the correlated output (i.e. a Walsh transform paragraph 0021) and that decision is used to control receiver DFE for interference cancellation; figures 7 and 10) wherein the decoding

includes correlating the received code vector with a plurality of reference *code* vectors (31 in figures 6 and 8; paragraphs 0013) so as to produce a plurality of values corresponding to each of the reference code vectors, and wherein the values correspond to an amount of correlation between the received code vector and the reference code vectors.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Webster to generate a reliability factor (as shown by Iwamatsu, abstract; 21 in figure 6 and figure 7; the correlation value of Walsh transform is used as a reliability factor) based on received signal values in the Gosse as in the Walsh structure of Webster to make a decision for the reliability of the received signal in the system to make an improved equalizer system in the detector to advantageously have better reception with less complexity with optimized signal to noise ratio and lower propagation errors in the decision feedback equalizer.

Regarding claim 75:

Gosse discloses all of the subject matter as described above except for specifically teaching the reliability is generated from the difference between two of received signal values.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where a reliability factor (paragraph 0018 a decision based the correlated output (i.e. a Walsh transform paragraph 0021) and that decision is used to control receiver DFE for interference cancellation; figures 7 and 10) based upon a difference between at least two of the received signal values (paragraph

0062, the values to update taps are stored in a look up table, and the values are corresponding to sets of received code words, paragraph 0019).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Webster to generate a reliability factor based on received signal values in the Gosse as in the Walsh structure of Webster to make a decision for the reliability of the received signal in the system to make an improved equalizer system in the detector to advantageously have better reception with less complexity with optimized signal to noise ratio and lower propagation errors in the decision feedback equalizer.

Regarding claim 77:

Gosse discloses all of the subject matter as described above except for specifically teaching generating reliability based on a comparison of the one received signal value to a threshold.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where a reliability factor based upon received signal values (paragraphs 0018 and 0062, the values to update taps are stored in a look up table, and the values are corresponding to sets of received code words, paragraph 0019) a reliability based on a comparison of the one received signal value to a threshold (claim 6 points out the Walsh transform is generated by comparing received signal to a predetermined code, that is used for decision for reliability; paragraph 0066).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Webster to generate a reliability factor (as shown

by Iwamatsu, abstract; 21 in figure 6 and figure 7; the correlation value of Walsh transform is used as a reliability factor) based on received signal values in the Gosse as in the Walsh structure of Webster to make a decision for the reliability of the received signal in the system to make an improved equalizer system in the detector to advantageously have better reception with less complexity with optimized signal to noise ratio and lower propagation errors in the decision feedback equalizer.

Regarding claim 78:

Gosse discloses all of the subject matter as described above except for specifically teaching that the reliable or error signal/factor is generated based on the difference between square of received signal value.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where the reliability is generated based on the difference between square of received signal values (paragraph 0056).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to generate a reliable signal/factor if the compared received signal value is greater than the threshold to generate the reliable signal/factor if the received signal value is greater than threshold to make sure the noise or interference level is under a limit to make an improved equalizer system for better reception.

Regarding claim 81:

Gosse discloses all of the subject matter as described above except for specifically teaching that generating reliability factor based on difference between two of the values.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where a reliability factor (paragraph 0018, a decision for reliability based on the correlated output (i.e. a Walsh transform paragraph 0021) and that decision is used to control receiver DFE for interference cancellation; figures 7 and 10) based upon a difference between two of the received signal values (paragraph 0062, the values to update taps are stored in a look up table, and the values are corresponding to sets of received code words, paragraph 0019).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Webster to generate a reliability factor based on received signal values in the Gosse as in the Walsh structure of Webster to make a decision for the reliability of the received signal in the system to make an improved equalizer system in the detector to advantageously have better reception with less complexity with optimized signal to noise ratio and lower propagation errors in the decision feedback equalizer.

Regarding claim 83:

Gosse discloses all of the subject matter as described above except for specifically teaching that generating reliability factor based on a comparison of the one received signal value to a threshold.

Webster in the same field of endeavor discloses a receiving system and method with embedded decision feedback equalizer where a reliability factor (paragraph 0018, and that decision is used to control receiver DFE for interference cancellation; figures 7 and 10) based upon received signal values (paragraph 0062, the values to update taps

are stored in a look up table, and the values are corresponding to sets of received code words, paragraph 0019) a reliability based on a comparison of the one received signal value to a threshold (claim 6 points out the Walsh transform is generated by comparing received signal to a predetermined code, that is used for decision for reliability; paragraph 0066).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use teachings of Webster to generate a reliability factor based on received signal values in the Gosse as in the Walsh structure of Webster to make a decision for the reliability of the received signal in the system to make an improved equalizer system in the detector to advantageously have better reception with less complexity with optimized signal to noise ratio and lower propagation errors in the decision feedback equalizer.

9. Claims 62, 67, 72, 74, 76, 80 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gosse et al. (US 6,690,723) in view of Webster et al. (US 2001/0036223) and further in view of Iwamatsu et al. (US 6,690,714) as applied to claim 60 and 66 above, and further in view of Khayrallah et al. (US 6,320,919).

Regarding claims 62, 67, 74 and 80:

Gosse discloses all of the subject matter as described above except for specifically teaching that the received signal value is largest one of received signal values.

Khayrallah in the same field of endeavor discloses a method and receiver for data detection where the received signal value is largest one of received signal values (column 13, lines 19-26).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to generate a reliable signal/factor if the compared received signal value is greater than the threshold to generate the reliable signal/factor if the received signal value is greater than threshold to make sure the noise or interference level is under a limit to make an improved equalizer system for better reception.

Regarding claims 72, 76 and 82:

Gosse discloses all of the subject matter as described above except for specifically teaching the reliability factor is generated is based on the difference between square of largest and next to largest values of received signal.

Khayrallah in the same field of endeavor discloses a method and receiver for data detection where the reliable factor is generated is based on the difference between square of largest and next to largest values of received signal (column 13, lines 1-26).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to generate a reliable signal/factor based on different parameters such as coefficients of tap values and signal to noise ratio including the square of largest value and based on the difference between square of largest and next to largest value in the received signal to generate the reliable signal/factor if the received signal value is greater than threshold to make sure the noise or interference level is under a limit to make an improved equalizer system for better reception.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HIRDEPAL SINGH whose telephone number is (571) 270-1688. The examiner can normally be reached on Mon-Fri (Alternate Friday Off) 8:30AM-6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. S./
Examiner, Art Unit 2611
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611